COMPETING MODELS FOR INTELLIGENT SYSTEMS ANALYSIS
OF CLIENT-THERAPIST TRANSACTIONS

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Summary

As one phase in a study of 'intelligent system' utilization for understanding facilitating
the interaction between a patient and a psychotherapist, contrasting models of their verbal
exchanges are examined critically. The two emergent models studied are the essentially Speech
Act Theory model used by William Labov, et al., and our own initial formulation of a Discourse-Analytic model. Extent of computational operationalizability, degree of fine-grainedness of analysis, and other properties of the two developing models are examined. Focus and precision are provided for the comparison by using each model vis-a-vis the same body of primary data. The prospective usefulness of such an intelligent systems capability both as a clinical aid and for research on the therapeutic process is clarified in the discussion of the results of using each of the contrasting models. To aid in assessing the feasibility of realizations of the models in intelligent systems programs, the issue of tacitness/explicitness in their present form is directly addressed.

Among computer-based systems the subset of them that operates upon 'natural language' is currently of prime research importance—both because, for technological advance, "natural language computing" is critical to many facets of the next stages of the computer revolution and because, for scientific advance, understanding man's ability to manipulate symbol systems is a primary axis for differentiating human beings from other organisms. Computer-based systems which cope significantly with natural language symbol systems are characterizable as intelligent systems. This paper is an exploration of differing analytical approaches to human 'natural language' behavior with a view to assessing the promise of these varying approaches for incorporation into computer-based intelligent systems. The examples of human language exchange we attend to here are drawn from the clinical literature. Seeking to better understand such language exchanges is significant for its potential practical application to clinical process, for its contributions to our general understanding of language behavior (and hence to the social/behavioral sciences as well as linguistics), and for its relevance to the formal sciences themselves (e.g., computer science as science).

Inasmuch as in "Formalized Historiography" we have recently discussed at some length currently emerging enhanced criteria for scientific achievement and their implications for a science of language, we will not here discuss those issues in abstracto. But it should be noted that a central feature of our study of current approaches to the language of patient-clinician transactions is that they be toughly evaluated with reference to their relative computability. The day is passing—although some may feel, too slowly, and others, too quickly—when an 'abstract' verbal analysis of language without the rigor implied by a requirement of its operationalizability on the computer could be considered in some sense satisfactory, provided of course that it passed the ancient implicit test of consensuality (i.e., others repeated the language of the putative ‘analysis’). We may say that we 'understand' language strings, and discourse, in proportion as we can automatically generate them by rule on the computer without human intervention. As in this paper we assay varying routes toward that goal we also are contributing to another of our fundamental research objectives: the understanding of scientific disciplines and professions as differentiable and machine-imitable social dialects.

Anyone familiar with the state of current
knowledge in sociolinguistics, as also with reference to the detailed dynamics of patient-clinician interactions, can only hail with enthusiasm the accomplishment of Labov and Fanshel in Therapeutic Discourse, Psychotherapy as Conversation. Its careful attention to the particularity of a clinical transaction provides a higher resolution as to what goes on under such circumstances, and will rightly serve, no doubt, as a model for much subsequent work—especially, perhaps, in the way of doctoral dissertations. They were not, however, oriented toward computational realizability as a criterion—much less, as the critical criterion—for testing the adequacy of their effort. In principle it could have happened that even without that aspiration they might, nonetheless, have in effect provided us with a highly computer-realizable analysis. In fact—and in no way to their discredit—they did not.

In the perspective of "potential applications of computer technology to patient care" it is not only consequential that they did not, it is far more consequential that on close inspection the analysis is found to be far more supported by 'consensuality' than by any foreseeable prospect of operationalizability, especially scientific (contra engineering) operationalizability, where we expect specific procedures to be derived from widely-applicable, encompassing ideas/algorithms rather than from non-transferable special purposes 'fixes'.

The essential difficulty in moving from the 'analysis' provided in Therapeutic Discourse to a sternly scientific analysis and synthesis of such data as Labov and Fanshel there examine is a difficulty not of their making. It derives from properties of the Speech Act Theory, which they employ. For all its lauded accomplishments Speech Act Theory suffers from a fundamental flaw: it is a continuation of the speculative (fantasizing) 'intentionality' mythologies so long beloved of pre-scientific efforts at the study of people and their acts. The test of the acquisition of 'analyses' provided in Therapeutic Discourse is not 'perfect'. Far from it. As we will see, the recorded sessions of the client with the therapist, with 'something else'. Unfortunately the something else in question is not to be found in the data, but in an 'interpretation' of it; if that interpretation were a lawfully controlled—i.e., formally adequate—transform of well-specified segments of the linguistic string, then there might have been no problem; but in fact, as already indicated, the 'transform' is uncontrolled, and however suggestive it might be it is not substantive of the general form 'if A, then B'.

Apart from any theory-of-method grounds for objection to optimism about the computability of these 'interpretations' and, hence, of 'meanings' (e.g., 'tension release'), to be correlated with the acoustic contours, for those who are additionally reassured by an experiential finding it is worth noting that the extensive experience of the (D)ARPA Speech Understanding projects (as at Carnegie Mellon University; Bolt, Beranek, and Newman; the System Development Corporation) underscores the lack of success in mapping directly from acoustic information into a lexicon of meanings. The similarities among contours have proved to be too great—relative to known instrumentation and techniques—to allow of unambiguous discrimination among them as needed for reconstruction at the level of meaning. In point of fact even within known and highly constrained domains of discourse it has required the mobilization of both syntactic and frame-of-reference cues along with the acoustic cues to successfully approximate to a reconstruction ('synthesis' or 'formation') in verbal elements of an original test string within a discourse.

To convert the categories current in Speech Act Theory, such as is used in Labov and Fanshel, from their current character of fantasizing 'abstractions' itself implies a sophistication in language analysis at least currently well beyond the state of the art.
On critical examination does Discourse Analysis Theory in its present form fare much better than Speech Act Theory? Somewhat, but not much, though the important differentia is a choice by Grimes and others of string properties which, comparatively, look to be operationally construable, even though they have not been so construed in anything like every present or prospective desirable instance. In the concluding section of this paper we will indicate how out of our earlier work and sometimes building on the efforts of Grimes and his students--we have begun to provide a computer-realizable analysis of discourse, including a set of categories and theoretical relationships (i.e., emergent Discourse Analysis Theory).

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First of all, what is discourse? Rather to our surprise we've discovered that a number of scholars, perhaps including Labov and Fanshel, interpret discourse as if it were at least quasi-synonymous with dialogue. Others working in the area of discourse analysis--linguists such as Robert Longacre and Joseph Grimes--would certainly regard such a definition as excessively narrow and restrictive. We find the broader constructions more useful.

Generally, discourse may be thought of as any spoken or written string of linguistic elements perceived as comprising a unit. In practice, discourse analysis is usually concerned with units larger than the individual sentence. That is not to say discourse analysis is not concerned with micro-linguistic phenomena, such as tense and aspect and other such categories, but that concern is with the way(s) these phenomena both bind together and make understandable strings of sentences, paragraphs, chapters and the like.

Literary critics concerned with characteristics of the structure of literary texts, of course, have long been performing a particular type of analysis of discourse. Now linguistics seems to be emerging both as central to the analysis of discourse, and even as a paradigmatic focus for the analysis of discourse. In part, that has come about because a number of creative linguists associated with the Summer Institute of Linguistics, including Longacre and Grimes, have for many years been applying their linguistic expertise to problems of translation from one language to another.

As in the course of early machine translation efforts it became apparent that word-for-word translation from one language to another was not successful, so it is also apparent that sentence-by-sentence translation is inadequate. Pronouns, for which the specific identificational/referential information is often located somewhere other than within the sentence in which the pronouns occur, are an often cited example of linguistic phenomena which cannot be satisfactorily explained/understood by models which take the sentence as the unit within which phenomena are to be explicated. Ellipsis is another example of a frequent phenomenon for which extrasentential information is mandatory. Other areas of linguistic investigation such as presupposition and implicature are also helping to lead linguists beyond the comforting boundaries of the sentence into the great, but rather formidable, unknown.

This surge of interest in discourse analysis among linguists is now occurring in parallel with--and receiving additional impetus from--a strongly felt need to do something about the reading and writing skills of youngsters in our school systems; requests for research proposals in the areas of reading comprehension and composition now frequently make reference to discourse.

As the earlier reference to 'the great unknown beyond the sentence may be taken to imply there is at present no coherent theory or model for the analysis of discourse. In their early work Longacre and students associated with him--drew on ideas from tagmenic analysis and have produced some intuitively satisfying gross distinctions among various types of discourse--such as narrative, hortatory, and procedural discourses. The discourse categories or units used in their models are, however, very coarse. For example, in narrative paragraphs, build-up tagmemes are identified; and in explanatory paragraphs, there are, among others, reason, result and warning tagmemes. The 'existence' of such units in these types of discourse may seem intuitively likely, but such 'intuitive' recognition is a long way from the knowledge to write rules which will generate or describe build-ups or warnings. Longacre certainly recognizes these problems and for the study of discourse, he has shown a willingness to consider a broad range of linguistic models and analytical procedures. In a recent paper, Longacre urged his audience to

"become increasingly aware of the importance of discourse analysis... As a by-product..., we may find ourselves once more in some sense leading the field... Of linguistics... instead of working off in some little corner all by ourselves. We can contribute to new and exciting development on the frontiers of our discipline. Rather than continuing to squabble over different points of view and approaches we can use every possible approach to a better understanding of the subject at hand."

In their book, Therapeutic Discourse, Labov and Fanshel relied very heavily upon ideas from Speech Act theory, while Grimes, although also associated with the Summer Institute of Linguistics took a somewhat different tack from that followed initially by Longacre. We will use some of the ideas of Grimes and his students as a point of departure for the core of this presentation. In his book, The Thread of Discourse, Grimes describes some discovery techniques, or
heuristics, for the analysis of discourse. It occurred to us that it might be instructive to use these discovery techniques for analysis of some of the material also analyzed by Labov and Fanshel in Therapeutic Discourse, and then to compare the results of the two approaches to establish what had been learned about discourse and its analysis. We chose to try to analyze the Episode 1 dialogue between the patient and therapist in the Labov and Fanshel material; and the procedure was to study that episode both in isolation from all other episodes in Labov and Fanshel and prior to reading any parts of the Labov and Fanshel book, which describes their analytical procedures and presents their interpretations of discourse patterns made 'apparent' by their procedures. The two discovery techniques described by Grimes that we used are the Thurman Chart and Span Analysis. Thurman was a student of Grimes and he proposed a chart (Figure 1) which would help the discourse analyst, both to identify constituents of discourse and to see what sort of patterns the constituents formed within the discourse being examined. Span Analysis (Figure 2) is a condensed version of information from the Thurman Chart (although it need not be restricted to the Thurman Chart), and it is intended to reveal patterning more clearly. The Thurman Chart assumes that the investigator has already identified the boundaries of the discourse to be examined. Thus, a basic decision—selection of a linguistic string as a discourse—is a priori relative to the discovery techniques provided by the Thurman Chart. It is possible, of course, that examination of the Thurman Chart will provide data supporting the a priori choice, circularly; but that remains to be seen. Since we elected to use the Labov-Fanshel material, we simply chose as the discourse unit the material they had already designated as Episode 1.

Probably we should note in passing that our inclination when using any discovery technique is to proceed as far as possible 'thoughtlessly.' Then as a guide to basic assumptions one can inspect whatever has been written down—that is, the discovery technique can help make explicit what has been taken for granted. Also, when it is not possible to proceed further thoughtlessly, one is made aware of gaps in what may be referred to as an implicit set of rules. Such gaps force one to examine the rules with a view toward reworking them, expanding them, or both.

The first task in using the Thurman Chart is to write in the left-most column the string constituents of the discourse. In his description of the Thurman Chart, Grimes suggests that the string constituents be clauses, and we began to break up Episode 1 on the assumption of following that suggestion. In our first entry on the Thurman Chart was "I don't know...whether" and our second entry was "I-I think I did the right thing." Obviously we were already in trouble because we had two possible clauses in the second entry. Pretty clearly, when reading "I-I think I did the right thing," we presumed an elided "that" serving as a connective between "I-I think" and what was being thought, which conceptually produced a single clause, "I-I think I did the right thing." Students in a University of Kansas linguistics course (Linguistics 728, Discourse Analysis), felt "that" was presumption and urged clinging to the 'surface' if at all possible. Since we agree with them as to the importance of the 'surface,' --alternatively, the reality under inspection—we decided to divide "I-I think" from "I did the right thing." But we were amused to notice, when the chart was redone in order to add categories and shift categories, that once again we automatically combined "I-I think" with "I did the right thing." As will be evident in the analysis of this particular discourse, it is desirable to separate "I-I think" from "I did the right thing." Having made this decision as to the units, other analogous divisions of what we had intuitively defined as clauses were necessary. As an indication of how firm assumptions are in some of these matters, we might note that initially no one in Linguistics 728 could bring himself to make some of these further divisions—but ultimately decided that what we had to behave consistently. So, for example, in 1.1 C in Episode 1, "now I don't know" is separated from "if I did the right thing" and in 1.5 A "I know" is separated from the material preceding it and from "that I can get along without my mother" and in 1.5 B "I know that" is separated from the following material. Clearly, at this point, the notion of the clause as in some sense the primitive string constituent has been abandoned. In 1.5 A, the connecting "that" is not elided ("I know that I can get along without my mother," and each of the other examples just cited also represents a departure from the clause rule). Later, we decided to set up a separate category (Speech Acts) for the "I know's," "I think's," etc. Because we felt that such statements might provide leads to the psychological status of the patient and, thus, that they should indeed be separated out whether or not they were independent clauses.

Another assumption, based on the ways we write dialogue on paper, was to consider such strings as "So she said, "oh, why?" as a unit. Again, there was objection from some of the Linguistics 728 participants and divisions were duly made between "so she said" and "oh why." In the other analogous examples in the episode, "I said" and "she said" were all separated out from the actual quotations. The quotations themselves were treated as units and on at least one occasion the quotation was perceived as consisting of two units. That occurs in 1.10, "well, things are getting just a little too much" which is separated from "This is—is—is gettin' too hard and...I." At the time we were trying to identify the discourse constituents for the Thurman Chart, we were also reading John Lyons's two volume overview.
of semantics [semantics 1 and Semantics 2] and noted that the division of language functions into descriptive, expressive, and social functions might be helpful--perhaps especially in this particular Episode 1 context of a conversation between a patient and therapist. Descriptive information is taken to be factual in the sense that it can be explicitly asserted or denied, and expressive information is that component of language which "covaries with characteristics of the speaker." The social function of language, defined as serving to establish (form) and maintain (transform) social relations, is interconnected with the expressive function, and, in fact, Lyons later uses the term "interpersonal" to subsume both expressive and social. It seems that by separating out the "I don't knows," "I thinks," etc. we were identifying linguistic information which varied with the characteristics of the speaker, and that, therefore, we were making some distinction between interpersonal information and descriptive information.

In the sample Thurman Chart, taken directly from Grimes, you see that there are headings for Event, Identification, Setting, Background, Collateral, and Performative. There are also vertical lines on the chart and each of those lines is to be assigned to a participant: if a given participant appears in a certain event, then a mark is made on the line. We decided to try to use each of the categories suggested by Grimes. In addition, we divided Setting into spatial and temporal setting and added a column, PLP. PLP stands for "Pesky Little Particle" and is used by Grimes to refer to function words ordinarily operating at the clause level or above. We also included a column for anaphoric reference (referring back) and cataphoric reference (referring forward). In addition we explicitly included a Non-Event column.

Grimes does not provide clear definitions for his suggested categories. There are, instead, 'intuitive' guidelines based on examples, as well as a few statements as to what the categories comprise. It should be borne in mind that the categories often overlap. They are not mutually exclusive. Thus, his categories "Event" and "Participants" are interrelated and, essentially, defined in terms of each other. An event is anything done by a participant and, according to Grimes, the participant is a human being who does something.

To economize we will indicate in the context of the Grimes definitions some of our divergences from Grimes. We feel that participants do not have to be human or even animate. It is possible, though, that anything identified as a participant fulfill the role of Agent. The identification column refers to participants only. Any reference to a participant--whether the reference is by pronoun, proper name, common noun, or whatever--is recorded in the Identification column. When dealing with the patient-therapist episode we used this column to include identifications, such as "nobody else," "everybody else," (cf. 1.6.6), and "things" (cf. 1.10), for which we hadn't explicitly made columns in the Participants' section. We decided that in this context "nobody else" and comparable locutions were filling Agentive roles and should be thought of as participants.

To proceed with the Thurman Chart categories provided by Grimes, Setting is, of course, the place and time in which the events take place. As observed earlier we immediately decided that there should be separate columns for spatial and temporal settings.

Grimes regards Setting, Background, and Collateral as non-event information. Background is vaguely described as the "secondary information used to clarify a narrative." Such information, to quote Grimes again, "is part of the narratives themselves, but stands outside them and clarifies them." Collateral is that information in the narrative, which instead of telling what did happen, tells what did not happen. "It ranges over possible events, and in so doing, sets off what actually does happen against what might have happened." We will recur to the subject of Background and Collateral as categories, and here will only note that we soon decided that Background information could certainly include events used as background.

By inference from his examples, Grimes defines Performative in a variety of ways, ranging from the function of "I pronounce you man and wife" through the statement "Your back porch just fell off" to saying that "The place where an act of speech occurs is also part of the performative information." In an initial pass at Episode 1, we listed under Performative deictic information pointing to the speaker and the hearer and to the location of the speaker and hearer. Under "Pesky Little Particle," we had all of the therapist's "M'ms" and "Mm-hms" as well as "whether," "sos," "ands," and so on.

Initially in trying to fill in the columns on the Thurman Chart there were a multitude of problems, the resolution of some of which we have already indicated by stating how our definitions of some of the categories represents in some instances a departure from that provided by Grimes. It should be noted that Grimes strongly urges the application of the Thurman Chart and of Span Analysis only to simple narratives. He characterizes simple narratives as having well-separated participants and a narrative sequence in which events that are told match the sequence in which the events actually happened. Grimes says that texts with flashbacks or that begin in the middle of things should not be considered, at least initially.

Episode One is not a simple narrative, and thus it might be expected that some of Grimes's categories would not cop with Episode One. On the other hand, it was difficult for the students
in Linguistics 728 to find narrative simple enough to be comprehended by Grimes's categories. In general, we think it is sometimes desirable early on to try to get from simple cases to more complex cases. We all understand the need for sometimes beginning with a simple case, but there is always the serious danger of regarding the simple cases and categories appropriate to those cases as the primitives upon which all else will be built.

One can look at almost any field to see the confusion of the "easy" case with the primitive, or basic building block. The area of data bases in computer science provides a very nice case in point. Early on, some computer scientists seem to have supposed that if they knew how to manipulate and analyze a table containing, say, 100 words, they would then be able to apply directly what they had learned to all other such tables, no matter how large. They have since discovered that a very large data base is, in itself, a primitive in a very large data base system. A very large data base is likely to occupy all available space in the central computer as well as being scattered around on disc files, or tape files, or both. Such an entity is an entirely different object from a little table held in the main computer, and its manipulation and analysis require a very different manipulative and analytical system.

Likewise in Linguistics, we believe there wouldn't have been the rigid divisions (labels) into say, Syntax and Semantics, if they had not somehow been transferred from what was at first seen as an easy-case problem solution approach—as for example, isolating syntactic considerations from semantic considerations and vice-versa—into being regarded as primitive categories. What we are beginning to see in Linguistics with the revival of the notion of systemic grammars by Halliday and others is, we hope, a carrying forward of the very attractive notions of language systems one found among the structuralists in the field of linguistics to more complicated conceptions of systems and interacting subsystems which will take account of the multiple functions of linguistic elements, and also provide the conceptual tools necessary for building theories and models adequate for a domain as complicated as discourse analysis.

All of this discussion is a way of emphasizing and suggesting reasons for our realization that the Thurman Chart categories as defined by Grimes were not going to be adequate analytical categories for much of the discourse we wanted to study.

When John Searle spoke to the Discourse Analysis class, we used that occasion to seek further clarity concerning the Performative. Partially as a result of that discussion, we decided to dispense with Performative as an analytical category and instead to introduce a Speaker/Hearer Axis (a term borrowed from Grimes) which would include deictic information that in turn would include participants and both Spatial and Temporal Settings. We also decided to include a column labeled Speech Act 'Particles' which would be separate from the entries in the PLP column. We felt that it would be desirable to distinguish between, for example, the use of "if" in 1.2.C ("like if she leaves on Sunday") and the use of "now" in 1.1.C ("now, I don't know if I did the right thing."). Also, it seemed necessary to do something not only with the therapist's "Mms" and "Mm-hms" but also with the "umms," stammers, "ands," "likes," etc. included in the client's discourse. In the new Thurman Chart, we disposed of the non-event category and instead had Speech Act Events, already mentioned, and Other Events. As to Background, we distinguish between Event Background and Other Background and also to try to keep track of the setting of Background within Background. Recognizing that to include Events in Background also meant including Participants, Identification, Setting, and all the other categories already in the chart, we list such information under the regular columns but subscript with a B or B1 (indicating nesting within Background) so as to indicate just what embedding of events, Participants within the events, etc. we were dealing with.

Setting up the Thurman Chart with these categories (Figure 3) made clear various sub-systems, including (a) the patient and therapist relating to each other, (b) the patient relating to some earlier event or thought which she wants the therapist to know about, and (c) the patient relating to her mother within the Background events she narrates.

Again, to economize, we will note here that Labov and Fanshel also recognize a need to identify embedded fields of discourse. Their fields are discussed in terms of the concentric frames in which the patient's behavior is embedded. In their interpretations the outermost frame is the institution of psychotherapy. Within that frame is the therapeutic interview. The field of discourse appropriate to that frame they label "interview style" (IV), noting that such discourse is easily recognized as characteristic of the therapeutic session by special vocabulary: 'interpretation,' 'relationship,' 'guilt,' 'to present oneself,' 'working relationship,' and so on. They identify it as "a more important mark of the interview style...The overt topic: emotions and behavior are evaluated as objects in themselves. In the interview style, one does not express emotions but talks about them."

Embedded within the Interview Frame is the Narrative Frame. The field of discourse appropriate to that frame they label "everyday style"
of the preceding days in a fairly 'neutral,' 'objective,' 'colloquial style.' Everyday style is 'marked by the absence of emotionally colored language on the one hand, and of abstract, therapeutically oriented language on the other.' When labelling fields of discourse in the patient-clinician sessions, Labov and Fanshel introduce N, "indicating a continuing narrative structure". Thus, embedded within Narrative are excerpts using a "family style" (F) of discourse. Family style is the field of discourse in which strong emotions are expressed. It is the idiom that "seems" to represent the style actually used in the patient's family situation. Examples of family style are "gettin' a little nuts" and the final "already" in 'gettin' a little nuts already.'

Labov and Fanshel's identification of Interview Style seems to rest almost exclusively upon semantic considerations, notably word meanings, and they do not say how they distinguish between discourse strings which express emotions and those which talk about emotions as objects. Everyday Style also would seem to rest upon semantic considerations ('neutral,' 'objective,' no 'emotionally colored language') as well as upon whatever criteria (these seem to be assumed; they are not specified) Labov and Fanshel use to identify a discourse string as a narrative. Family style seems in part dependent upon semantic considerations (expression of strong emotions) as well as upon alterations in word forms (the dropping of final endings, etc.).

The sub-systems we have tentatively identified—patient and therapist relating to each other, patient relating to an earlier event or thought which she wants the therapist to know about, patient relating to her mother within the Background events she narrates—certainly bear some resemblance to the fields of discourse identified by Labov and Fanshel. But the systems we have in mind more strongly correlate with shifts in mood, tense, and other deictic information relative to the basic Speaker/Hearer Axis than do the Labov and Fanshel fields, which seem more specifically tied to the therapeutic interview context.

Our Thurman Chart analysis shows the multiplicity of function of some of the linguistic elements in the episode. For example, the frequently appearing identifier "I" (and variants of "I") refers both to the Speaker/Hearer Axis and to a speaker relating to a past event, and to a speaker participating in past events. One sees the "I" both under the Speaker/Hearer Axis and under the participant identification column, and one also sees the "I" merging in and out of various forms of Background information. The Span Analyses Chart, in which patient, the mother, and therapist are differently indicated, makes those points (Figure 4).

Examples of units we treated as Background events are "I did the right thing," "Just a little situation came up," "I tried to use what I've learned here to see if it worked," and, further along, "I did the right thing." "Sunday my Mother went to my sister's again," and then nested within the latter is "and she usually goes for about a day or so, like if she leaves on Sunday she will come back on Tuesday morning," then labelled B, to show that it is nested within B, "and she usually goes for about a day or so, if she leaves on Sunday she'll come back on Tuesday morning." Because that material is both indefinite and conditional we listed it under Background rather than under Events. The only other entries under the Background column itself are strings that we would consider other Background, as in "Here this has to be done," "Here it has to be done," "but it seems that I have just a little too much to do," and others. A number of items under the Collateral column also serve as Background; examples are "I wasn't gonna say anything," or 'which would be that if I kept letting her stay there and didn't say.'

The markers of material that we often considered Background (this includes Collateral which functions as Background) included past tense (this is often but not always the case), and conditional and subjunctive moods. In 1.2.c, we interpret so—"so it's nothing"—as a continuation, probably a conclusion really, of the previous collateral conditional. However, this remark could also be interpreted as a direct statement to the therapist; thus it is another of the strings with a multiple function. Labov and Fanshel interpret it solely as a remark to the therapist and they regard it as a rebuke to what they see as the therapist's concern, voiced in the "I'm not doing it." The client is telling the therapist directly "she's still not home," but also this string links to "she left Sunday" and is connected to it by the PLP particle "and."
any one thing," "I'm not doing my school work right," "I'm just gonna tell her." Notice that some version of the present tense serves as a marker for these remarks to the therapist.

The therapist's "remarks" carry no Identificational information, Setting information, or Background information. The patient makes few explicit references to either spatial or temporal setting. There are just five explicit spatial references: "here" which refers to the place where the patient and therapist talk, "my sister's," and two "there's," which refer to the sister's home, and finally "home" pertaining to the patient's home. Because verbs performe provide it, there is much implicit temporal setting information, but the only explicit references are to "Sunday," (three times), "Tuesday morning," "today," and possibly "still" meaning up to and including right now in the clause "she's still not home." "So at first" may be a temporal reference in the phrase, "so at first I wasn't going to say anything," which certainly does imply temporal ordering, and here it provides a transition toward the recital of the dialogue between the patient and her mother. In a sense, "So at first" is a false transition because it does imply temporal ordering and a narrative ordering, which is not, in fact, immediately realized, since the patient doesn't get to that narration of the dialogue until after providing a variety of reasons for having made the telephone call. The "then" in "then I remembered that," which follows "so at first I wasn't going to say anything" seems to suggest that the progress toward the narrative is marching along nicely, although in fact the patient is still providing Background to what it was she said.

A few comments about Speech Act Particles are probably also in order. The therapist's "Oh-oh" and "Right" stand out among the speech acts. "Mm-hms" with which he relates to the patient. We should assume that the patient's "Mm-hms" and stammerings, "nows," etc. reflect not only difficulty in dealing with the subject at hand, but also reflect relating to the dialogue situation itself—and by the dialogue situation here, we mean not only talking to the therapist, but also simply the act of speaking aloud. It seems possible that some of this activity on the part of the patient would decline if the therapist or dialogue partner were saying more. In fact, one section of the Span Analysis Chart which shows the therapist interacting more frequently shows an absence of Speech Act Particles in use by the patient, but the other instance of relatively frequent response by the therapist also includes many Speech Act Particles on the part of the patient. That is the section in which the patient is narrating the mother's departure to the sister's house, as well as the fact that the mother is still not home on this occasion; so the use of Speech Act Particles here may relate to the trouble the patient has with this particular narrative material. One Speech Act Particle pattern is apparent from the Thurman chart; that is the use of "Well" as a signal of the beginning of a dialogue speech ("Well, when do you plan to come home?" "Well, things are getting just a little too much," "Well, why don't you tell Phyllis that," "Well, I haven't talked to her lately."). The only other use of "well," early in the Episode, occurs in "Well, I tried to ...well, try to... use what I've learned here," and here "well" also signals direct address, this time on the part of the patient to the therapist. Labov and Fanshel regard "well" as used in "Well, when do you plan to come home?" as a discourse marker which refers backwards to some topic that is already shared knowledge among participants (p. 156). They say that when "well" is a first element in a discourse or topic, this reference is necessarily to an unstated topic of joint concern. They argue that although the patient's remark is certainly not the first element in the actual conversation she had with her mother, it has the force here of referring to such an unstated topic, known to both the patient and her mother—a topic which is clearly the "reason" for the call. We tend to treat the use of "well" in Episode One as a particle signalling direct address. It's the speaker saying to the hearer "Pay attention now, I'm about to say something to you."

Labov and Fanshel devote almost seventy pages of their book to an analysis of Episode One and they proceed at a level which tends to assume the kind of analysis of pattern made apparent by the Thurman Chart and the Span Analysis Chart. The only basic data made explicit in their presentation is pitch contour information. Pitch contours enable them to interpret the therapist's interventions differentially depending upon intonation patterns. What Labov and Fanshel do is take some of this acoustic data, including cues such as an intake of breath, which they then interpret as a release of tension, to produce Expansions, which are based not only on what has already been said but what Labov and Fanshel know about what will be said later. The expansions are also based upon what they know of the situation for which the patient is being treated. For example, they take the following text (1.7 A) when the patient says "Which would be that if I kept letting her stay there and didn't say 'Look --I mean y' been there long enough; I'd just get tired an nd I I-m not doing my school work right."

The Expansion of this text (and its accompanying acoustic cues) is as follows: "and it would follow from this suggestion that if I kept letting my mother stay at my sister's house and didn't say to her something like 'look what you know but are avoiding: you have been at my sister's house long enough to take care of any obligation to her household and you are neglecting your primary obligation to me in our household, and so I am asking you to come home right away, and if I didn't express my needs and feelings in that way, then I would get tired, which everyone says I am not supposed to do, and since this is already
beginning to happen to me, since I'm not perform-
ing my obligations at school well enough....

Labov and Fanshel also include in their inter-
pretation inferences based upon a variety of
rules which are taken from, or modified from,
Speech Act Theory. For example, there is the
rule for putting off requests: If A has made a
valid request for the action of X of B and B
addresses to A

a. A positive assertion,
or request for information of the
existential status of X,
b. A request for information or
negative assertion about the time,
Ti,
c. A request for information or
negative assertion about one of
the four preconditions,

Then B is heard refusing the re-
quest until the new information
or negative assertion is sup-
plied or the negative assertion
is contradicted.

This is a rule which will be invoked in the in-
terpretation of the dialogue between the pa-
tient and her mother when the mother so obviously avoids
responding to the patient's request. We might
observe that in our notations on this Episode,
we had also noted, prior to reading Labov and
Fanshel, the mother's avoidance of responding
to the patient. Rather, she sets up a conflict
situation between the patient and her sister.
We had also noted that there is no way in Epi-
isode One through identification or reference to
tell whether the patient is male or female. It
was therefore a little interesting to learn in
the introductory material provided by Labov and
Fanshel concerning anorexia nervosa, from which
the patient suffered, that a characteristic of
a patient with this particular psychosomatic
disease which entails severe and dramatic weight
loss is a rejection of her sex.

Other than the acoustic data, the cate-
gories favored by Labov and Fanshel are at a
considerably more interpretative level and
based much more heavily upon semantic inter-
pretation, than are the categories used in this
analysis. We tend to think that much the same
interpretation of the patient's current state
could have been arrived at using the Thurman
Chart and Span Analysis. There isn't space to
provide all of the details that we noticed con-
cerning those charts, but do remember the mo-
tives cited earlier which stood out as remarks
to the therapist--I'm getting a little nuts--
I'm getting tired--I'm not doing my schoolwork
right--I can't concentrate--I'm just going to
tell her--and compare those to the expansion
cited earlier from the Labov-Fanshel treatment.
We certainly do not quarrel with the rules

It is somewhat surprising, more an abstrac-
tion onto which interpretations can be mapped.

It is appropriate to point out that Labov
and Fanshel do provide rules--of which we gave
an example--rules, which, as noted earlier, are
based upon Speech Act Theory. In contrast, we
have not offered so much as one rule. We are
moving in that direction, however, when refer-
ing to markers associated with Background,
Collateral, Events, and the like. At present our
inclination is toward positing rules within a
theoretical framework of interactive systems and
sub-systems, at least some parts of which will
be microlinguistic components such as tense,
mood, and aspect. Obviously there will be macro
components which may, in some cases, correspond
to categories in our modified Thurman Chart.
It's possible that state diagrams, which have
been used with considerable success to represent
syntactic parsing strategies for computer pro-
grams, may turn out to be a plausible way to
represent rules for the analysis of discourse
systems. At any rate these are directions for
research that currently seem rather promising.
We mean to explore them further.

By way of summation and to identify areas of
research that need to be addressed, in this final
section of this study, we will concentrate on
some of the needed preliminaries to intelligent
system realization of emergent Discourse-Analytic
Theory. Among the applications of programmed
instantiations of Discourse Analysis Theory would
be, prospectively, both research of a fundamental
sort on the therapeutic process and an addition
to the armamentarium of clinical aids available
to the therapist in assisting specific patients.

At this stage in their development Speech
Act Theory and Discourse Analysis Theory differ
markedly in their aptitude for programmed opera-
tionalizability. Earlier on we talked about the
problems in going from the interpretations pro-
vided by Labov and Fanshel to operative intelligent
systems; here we will discuss what of that sort we
think can be done now or imminent for the Discourse Analysis we have in mind--as a corpus of categories and theory, operationally specified procedures and their instrumented, computational realization.

In going beyond the categories utilized in the original Thurman Chart, we have found it expedient to break out Events into the separable classes of Speech Act Events and a residual Others. A general category of Participants is an addition, while another abstraction layer has had to be added to Setting: Spatial and Temporal. It proves to be critically important to incorporate under Background a provision for Nesting, to add a further general category in the form of Speech Act 'Particles,' and to introduce a Speaker/Hearer Axis containing deictic information relative to the Speaker and/or Hearer bearing on Participant Identification and the Spatial and Temporal aspects of Setting. (As with the relationships among content items falling in other categories, there is no necessary mutual exclusivity between information within the categories of the Speaker/Hearer Axis and information to be found elsewhere on the chart.)

Since the tenses of verbs usually can be automatically identified, often one might hope to establish whether or not a string segment belongs in the categories Background or Collateral, but except where there are certain conditional markers (e.g., "could") it is difficult to discriminate automatically into which of those two categories a string segment belongs. Word-matching techniques are employable for some deictic information (e.g., with the pronouns "here" and "there"). With some exceptions (such as with certain uses of the word "well"), speech-act particles are also practically identifiable computationally; and probably it would seem practicable to utilize word matching with PLP's (Pesky Little Particles), as also with some speech-act events. Word-matching also can be used with much Participant Identification, and word-matching (as with "yesterday," "tomorrow," and the like) can be employed in establishing some of the characteristics of Temporal Setting, while verb tense can enable us to get at other aspects of Temporal Setting.

With reference to anaphora and cataphora, the pronoun markers are easy enough to discern, but to establish the linkages between such pronouns and their appropriate nouns the application of a syntactic/semantic analyzer would probably be needed. Other anaphoric/cataphoric elements are more difficult to cope with, but content analytic methods using 'synonym' classes might provide some help.

By way of still further indication of the ways in which operationalizability on the computer can be achieved for Discourse Analysis--and an indication also of the direction some of our subsequent research in this domain may take--the reader is referred to Sections IV and VI of our study, "Formalized Historiography, The Structure of Scientific and Literary Texts: Some Issues Posed by Computational Methodology," in that paper as a whole we discuss the current state-of-the-art of natural language intelligent systems/artificial intelligence research. We consider ways in which that work, and other research more often described as content-analytic, may ultimately combine into general-purpose intelligent systems--by contrast with the ad hoc, non-generalizable systems which currently characterize much computer-based work on natural languages. We foresee a merging of the use of patterns of occurrence (e.g., word choice) and patterns of expectation (e.g., syntactic templates; semantic constructs) into systems which can cope more widely with natural language phenomena. In the more immediate future less sophisticated pattern matching may serve as the core of systems which can provide intelligent assistance to the therapist--for example, alerting him to language usage spans, and departures from spans, indicative of particular patient concerns.

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Footnotes


